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FOREST INSECT SURVEY

BLACK'S MOUNTAIN EXPERIMENTAL FOREST

Season 1942

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by

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Berkeley, California
February 11, 1943

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Forest Insect Laboratory
Berkeley, California
February 11, 1943

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BLACK'S MOUNTAIN EXPERIMENTAL FOREST

Season 1942

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FOREST INSECT SURVEY

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INTRODUCTION

The sixth annual survey to obtain the current record of insect-caused losses on the 10,000 acre experimental forest at Black's Mountain, Lassen National Forest, California, was made during September and October, 1942. The cruise of the 16 timbered sections was difficult because of our inability to secure satisfactory help during the field season. Three separate crews were mustered and trained for "spotting" before the survey was finally finished. The 1942 cruise was the fifth annual survey of the Black's Mountain Forest since responsibility for this work was assumed by the Bureau of Entomology and Plant Quarantine in 1938. The complete record of gross loss caused by insects in 1941 and the partial record for 1942, both of which were obtained during the current survey, are presented in this report. The infestation which may be encountered during 1943 can only be predicted from the conditions noted in 1942.

OBJECTIVES OF THE ANNUAL LOSS SURVEY

In 1937 the cooperating agencies studying certain phases of pine management at Black's Mountain agreed that a seasonal coverage of the entire experimental forest would be essential to maintain properly the detail of work which was being undertaken. By making the seasonal loss survey intensive and complete, it would be possible to follow accurately the infestation trends; to maintain stand inventories on all study areas; and provide for a yearly comparison of loss on check areas and those treated by sanitation-salvage methods.

RECORD OF LOSS FOR 1941

Characteristics of the Seasonal Infestation.

Indications of a decided break in the insect infestation on the virgin areas at Black's Mountain became evident during a partial cruise of the area in the season of 1941. The expected increase as predicted in 1940 was reversed and a drop in the infestation occurred. The estimate of loss which was made from a 20 percent sample of the remaining virgin areas during the fall months of 1941 placed the total kill at 41 board feet per acre. The cruise in 1942, which completed the record for 1941 on all areas, showed that total loss had been 43 board feet per acre. In general, trees which were killed during 1941 were scattered over the area. In no case was any concentration of loss noted, nor were more than two trees found infested in any single group. As in all previous years, the center of high volume loss in 1941 occurred in the timber on the south slope of Black's Mountain. Following are general statements of the loss in 1941 on all block areas within the experimental forest.

Block A. Ten compartment areas totalling 800 acres which border on the non-timbered flats are characteristic of that portion of the experimental forest where sage, bitter-brush, and dense pine reproduction form the ground cover beneath the overstory of overmature ponderosa and Jeffrey pines. The current infestation on these compartments showed less of a decrease from 1940 than any other area on the forest. In proportion to the total green stand, this loss was higher than any other timbered block during the year. The infestation occurred primarily in Jeffrey pine, and for this species the loss was only 19 percent below that of 1940. The record of loss on Block A in both species of pine for 1941 was 23 percent above the average for the forest as a whole.

Block B. There are 9 compartments totalling 942 acres on the south side of Black's Mountain still in a virgin condition. In all previous years losses on this area have been quite severe. Again in 1941 the highest volume in infested trees found on the experimental forest occurred in this timber. However, the volume of loss in 1941 was but 33 percent of that which occurred in 1940. The volume per acre loss in 1941 was 35 percent above the seasonal average for the forest as a whole. All loss was of a scattered nature and occurred primarily in ponderosa pine.

Block C. The first cuttings in the timber on the northwest side of Cone Mountain were made during the 1941 season and total losses on virgin areas for the year were obtained on only 1,826 acres. Losses in this block of higher quality timber were 64 percent below that of the previous year. The gross volume in insect-killed trees amounted to 36 board feet per acre, 16 percent below the average for the forest as a whole. All loss occurred in ponderosa pine and was evenly scattered over the area.

Block G. A majority of the cutting thus far completed on the experimental forest has been in the low lying compartments in this block. By 1941, 60 percent of this area, which included most of the compartments of high seasonal loss, had been cut. On the remaining 1,127 virgin acres, the infestation in 1941 was extremely low. The volume kill of 33 board feet per acre was 23 percent below the average for the forest as a whole and was 73 percent less than the loss found in 1940.

Block F. At the close of the 1941 season, 1,102 acres of virgin timber within the boundaries of the experimental forest remained on the southwest slope of Patterson Mountain. The 1941 infestation on this block was 58 percent below that of the previous year. The loss of 47 board feet per acre was widely scattered. No evidence was noted of local infestation centers.

LOSS CONDITIONS BY TREE SPECIES

Four species of trees occur in commercial quantities on the Black's Mountain Experimental Forest. Of the total merchantable volume, 90 percent is composed of a mixture of ponderosa and Jeffrey pine. Seven percent of the volume is white fir and three percent incense cedar. A tabulation of insect-caused loss in all tree species during 1941 is given in Table 1.

Table 1. 1941 Insect Loss. Black's Mountain Experimental Forest. Virgin Area. All Species.

Block	Timb'd Area	Species	No. of Trees	Volume BM	Volume per Ac.
A	800.6	Ponderosa pine	9	13,332	17
		Jeffrey pine	13	28,923	36
		White fir	-	-	-
		Incense cedar	-	-	-
B	941.5	Ponderosa pine	40	43,665	46
		Jeffrey pine	9	10,975	12
		White fir	3	1,277	1
		Incense cedar	3	2,053	2
C	1,826.0	Ponderosa pine	55	65,733	36
		Jeffrey pine	-	-	-
		White fir	17	11,008	6
		Incense cedar	-	-	-
G	1,126.8	Ponderosa pine	21	35,348	31
		Jeffrey pine	1	1,513	1
		White fir	-	-	-
		Incense cedar	-	-	-
F	1,102.4	Ponderosa pine	29	34,953	32
		Jeffrey pine	11	17,203	16
		White fir	7	2,564	2
		Incense cedar	1	588	.5
All	5,797.3	Ponderosa pine	154	193,031	33
		Jeffrey pine	34	58,614	10
		White fir	27	14,849	3
		Incense cedar	4	2,641	.5

During 1941 the infestation in ponderosa pine, the predominate tree species on the area, was 33 board feet per acre; a decrease of 65 percent from the average of 1940. In Jeffrey pine the 1941 loss averaged 10 board feet per acre. This is a decrease of 57 percent from the loss of 1940. In white fir losses were 89 percent below the 1940 level, averaging 3 board feet per acre. Very little change between the 1941 and 1940 loss record was found in incense cedar.

RECORD OF LOSS FOR 1942

The 1942 loss survey at Black's Mountain was the first year in which the entire forest area was cruised during the fall months. As a result of this late survey, a majority of all trees infested during the current season were recorded. It was found that the infestation in 1942 had been further reduced from the level of 1941. The gross loss in 1942 promises to be the lowest of any year since records were started on the experimental area in 1934. A correction factor allowing for infested trees which were not in evidence when the cruise was made has been applied to the amount of loss thus far recorded and with the correction factor applied, it is estimated that the total kill in 1942 will be about 23 board feet per acre. A comparison of losses in pine on all forest blocks for the past three years is given in Table 2. (page 5)

A comparison of the trend of loss in ponderosa and Jeffrey pine for the seasons of 1941 and 1942 is given in Table 3.

Table 3. Trend of Loss. Ponderosa and Jeffrey Pine. Season 1941-42.

	INSECT LOSS 1941				INSECT LOSS 1942 (estimated			
Tree Species	No.of Trees	Volume BM	Volume per Ac.	Ratio 41/40	No.of Trees	Volume BM	Volume per Ac.	Ratio 42/41
Ponderosa pine	154	193,031	33	.30	69	99,515	18	.52
Jeffrey pine	34	58,614	10	.37	12	29,273	5	.50

It is of interest to note from this table that the decrease in infestations for both ponderosa and Jeffrey pine was even and proportional in 1941 and 1942. Since the western pine beetle and the Jeffrey pine beetle are specific in their attack on these two species of pine, and because of differences in habits of the insects, there is reason to believe that opposite trends in infestations might occur. Reasons for the proportional decrease in losses for Jeffrey and ponderosa pine at Black's Mountain during 1941 and 1942 are not apparent at this time, but it seems likely that many of the climatic factors favoring the vigor of the host have been largely responsible for the present low ebb of all beetle activity on the area.

Table 2. Insect Loss - Black's Mountain Experimental Forest (Pine Species only)

Block	1940 LOSS					1941 LOSS					1942 LOSS (estimated)				
	Timb'd Acreage	No.of Trees	Volume B.M.	Volume per Ac.	Ratio 40/39	Timb'd Acreage	No.of Trees	Volume B.M.	Volume per Ac.	Ratio 41/40	Timb'd Acreage	No.of Trees	Volume B.M.	Volume per Ac.	Ratio 42/41
A	800.6	38	60,428	76	1.17	800.6	22	42,255	53	.70	800.6	7	21,296	27	.51
B	941.5	130	169,456	180	1.31	941.5	49	56,640	60	.33	941.5	12	15,386	16	.27
C	2,351.0	191	234,077	100	.90	1,826.0	55	65,733	36	.36	1,694.0	23	36,796	22	.61
G	1,126.8	89	136,245	121	1.89	1,126.8	22	36,861	33	.27	1,126.8	24	36,325	32	.97
P	1,796.6	173	202,240	113	.97	1,102.4	40	52,156	47	.42	1,102.4	15	18,985	17	.36
All	7,016.5	621	802,446	114	.97	5,797.3	188	251,645	43	.38	5,665.3	81	128,788	23	.53

OUTLOOK FOR LOSS CONDITIONS IN 1943

Very little factual data can be presented to show the probable trend of loss conditions during 1943. Insect populations at the end of the 1942 season were extremely low. It does not seem probable that a sudden upswing in loss would occur in a single season. Should the momentum of populations start upward in 1943, there would be little chance for more than normal loss to occur during the season. Very little change from the conditions encountered in 1942 is expected during 1943.

CONTRIBUTING FACTOR IN THE SEASONAL LOSS

The pathogenic root fungus, Fomes annosus, which has recently been reported as killing both ponderosa and Jeffrey pines in the Lassen Area (1) was found to occur on the Black's Mountain Experimental Forest during 1942. From what is thus far known, the root pathogen at Black's Mountain occurs primarily in the compartments in Block G near Grass Valley. Dr. Wagener, Senior Pathologist - Division of Forest Pathology, found evidence during the past season that the fungus has been present in the Black's Mountain area for a number of years. One tree marked as infested and killed by insects in 1939 was found with root infection. Another tree recorded in the 1941 loss and three trees found infested in 1942 had Fomes infection in the roots. Until further evidence is found that this root pathogen is generally present throughout the experimental area and is primary as an agent in killing mature and overmature trees, no appraisal can be made as to the extent this factor has contributed to the seasonal record of loss.

(1) Wagener, W. W. Fomes annosus as a Pine-killing Agent in Northeastern California. San Francisco, California. October 16, 1942.